

III. REMARKS

1. Claims 23-25 are new.
2. Claims 1-4, 6, 11-14, 16, 21 and 22 are not unpatentable over Lindoff in view of Höök et al. ("Höök") US Patent No. 6,473,506 under 35 U.S.C. §103(a).

The combination of Lindoff and Höök does not disclose or suggest that a phase of training sequences is changed by "cyclically" transferring the training sequences, as recited by Applicant in the claims. As recited by Applicant, "cyclically" transferring the training sequence relates to shifting the bits of the training sequence a certain number of bit positions to obtain a phase shift. There is no such disclosure in the combination of Lindoff and Höök, and the Examiner also notes this is not disclosed by Lindoff.

Höök relates to rotating the phase of symbols to be transmitted (Col. 4, lines 28-30). The phase is rotated by an "angular amount that is uniquely associated with the signaling information to be transmitted." (Col. 4, lines 31-32). The rotation of phase in Höök is not the same as changing a phase of a training sequence by "cyclically" transferring the training sequence.

In the system of Höök, the transmitter rotates each symbol by a certain factor, for example $-\pi/4$. The first symbol is not rotated at all ($0^*-\pi/4$) at transmission, the second symbol is rotated by $-\pi/4$, the third symbol is rotated by $-2\pi/4$ ($=-\pi/2$), and the fourth symbol is rotated by $-3\pi/4$. The receiver performs a corresponding de-rotation to the received symbols. The receiver is aware of the correct training symbol, which in the example provided by Höök, is 0110. The receiver has to de-rotate each of the received samples until the expected value is detected. For example in col. 4, lines 63–66 of Höök it is stated: "*In doing so, the receiver is able to recognize that a phase rotation factor of $\pi/4$ is needed to recapture the sequence 0110.*" The receiver can try different rotation factors e.g. $-\pi/4$, $-\pi/8$ and when the receiver has detected the correct sequence, it is aware of the modulation method used in the transmission (e.g. whether 4-PSK or 8-PSK has been used).

Further, figures 1A, 1B, 2A—2D of Höök reveal that the rotation of the phase means angular rotation of symbols for M-PSK modulation scheme (M-ary phase shift keying modulation method). For example, the 4-PSK method has four different phase shifts each representing one symbol (out of four). This means that each symbol can transmit the information of two bits (00, 01, 10, 11).

This rotating phase of symbols to be transmitted in Höök is not the same as, and does not change the phase of a training sequence by cyclically transferring the training sequence as claimed by Applicant. For example, using the system claimed by Applicant if the training sequence 0110, shown in Höök 0110, (Col. 4, lines 43-45), were cyclically transferred, the following alternative for the training sequence would result:

0011 (one time shifted to the right)

1001 (two times shifted to the right)

1100 (three times shifted to the right)

0110 (four times shifted to the right)

The results of a cyclical transfer of the training sequence shown above are not the same as the results of the phase rotation of Höök. In Höök, the example of FIG. 1A, the phase rotation involves a rotation factor of $-\pi/4$. Thus, the symbol N is "transmitted" with a logical value of 0 and a phase rotation of 0 (i.e. $0 \cdot \pi/4$). In Höök, this phase rotation is performed at the modulation. In the system of Applicant's claims, the cyclical transfer of the training sequence is performed for the symbol before modulation. Thus, Höök does not disclose or suggest at least these features claimed by Applicant.

Since neither Lindoff nor Höök disclose or suggest at least these features claimed by Applicant, their combination cannot as well. Thus, claim 1, 11, 21 and 22 should be allowable. Claims 2-4, 6, 12-14 and 16 should be allowable at least by reason of their respective dependencies.

Furthermore, it is submitted there is no motivation to combine these references for purposes of 35 U.S.C. §103(a).

In order to establish a *prima facie* case of obviousness under 35 U.S.C. §103(a), there must be some suggestion or motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. There must also be a reasonable expectation of success, and the reference(s), when combined, must teach or suggest all of the claim limitations. (See M.P.E.P. §2142).

As noted previously, the phase rotation of Höök does not provide the same result as the cyclical transferring of the training sequence claimed by Applicant. Thus, one would not look to Höök from Lindoff to try to achieve what is claimed by Applicant, and the combination cannot result in what is claimed by Applicant.

Thus, it is submitted that claims 1-4, 6, 11-14, 16, 21 and 22 are not unpatentable over Lindoff in view of Höök.

3. Claims 7 and 17 are not unpatentable over Lindoff in view of Höök and further in view of Guan at least by reason of their respective dependencies.

4. Claims 5, 9, 10, 15, 19 and 20 are not unpatentable over Lindoff in view of Höök and further in view of Persson at least by reason of their respective dependencies.

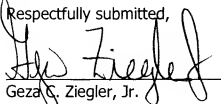
5. Applicant appreciates the indication of the allowability of claims 8 and 18, but submits that the claims should be allowable by reason of their dependencies.

6. Claims 23-25 further clarify the scope of claim 1 and are not taught by art of record.

For all of the foregoing reasons, it is respectfully submitted that all of the claims now present in the application are clearly novel and patentable over the prior art of record, and are in proper form for allowance. Accordingly, favorable reconsideration and allowance is respectfully requested. Should any unresolved issues remain, the Examiner is invited to call Applicants' attorney at the telephone number indicated below.

The Commissioner is hereby authorized to charge payment of \$150 for the additional claims and for any other fees associated with this communication or credit any over payment to Deposit Account No. 16-1350.

Respectfully submitted,



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